

(12) UK Patent Application (19) GB (11) 2 163 973 A

(43) Application published 12 Mar 1986

(21) Application No 8521758

(22) Date of filing 2 Sep 1985

(30) Priority data

(31) 647119

(32) 4 Sep 1984

(33) US

(71) Applicant

Jactac Inc. (USA-California),
879 Mountain View Drive, Lafayette, California 94549,
United States of America

(72) Inventor

Merle R. Hoopengardner

(74) Agent and/or Address for Service

Forrester, Ketley & Co., Forrester House, 52 Bounds Green
Road, London N11 2EY

(61) INT CL⁴

D06N 7/04

(52) Domestic classification

B2E 1531 1534 1539 1540 1703 1739 436S 443S 474S
553T 600T M
U1S 1220 B2E

(56) Documents cited

GB 1284860

GB 1227377

GB 1007281

GB 0522068

GB 0493847

GB 0406697

GB 0252776

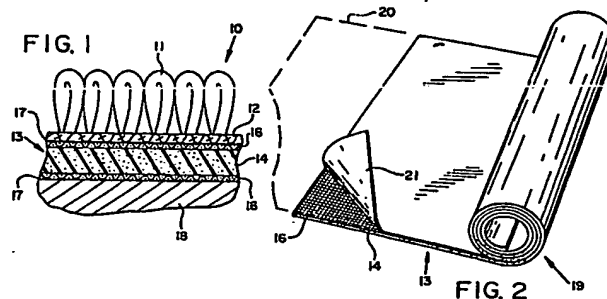
DE A utility model 7905528

(58) Field of search

B2E

(54) System for holding carpet in place without stretching

(57) A carpet (10) and pad (13) installation avoids the need for stretching and tackless strips by utilizing a pad (13) with pressure-sensitive adhesive (17) on its upper and lower surfaces. The pad (13) is first laid on the floor surface and trimmed as required, with its lower adhesive surface adhering to the floor. Its upper surface has a removable release film (21) covering the pressure-sensitive adhesive, permitting the carpet (10) to be unrolled over the release film and then cut and seamed as required. The seamed carpet is folded back and the release film (21) is removed from the exposed area of the carpet cushion (13), then the carpet is pressed down onto the exposed area of adhesive. Then another portion of the carpet is folded back, the release film is removed from that area, and that portion of the carpet is pressed onto the exposed pressure-sensitive adhesive of the carpet cushion.

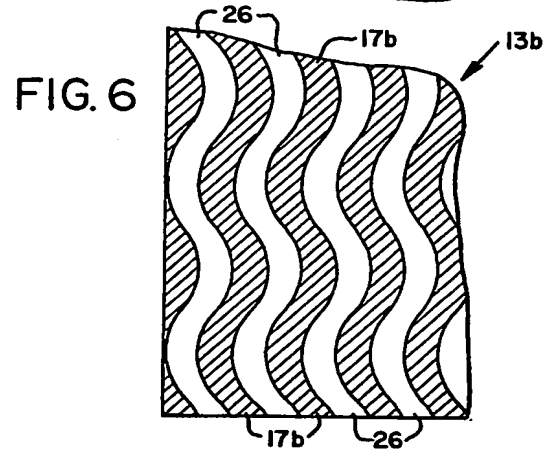
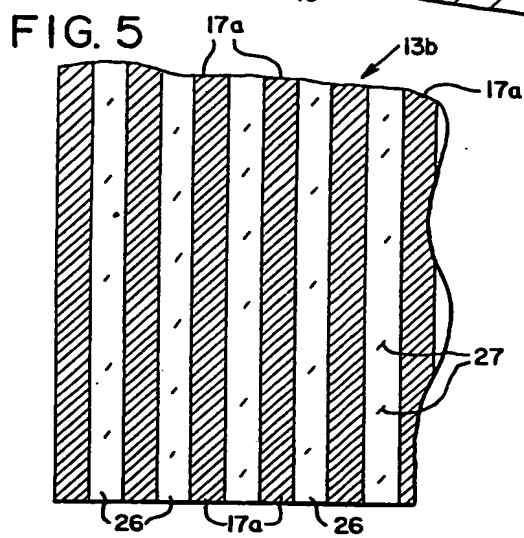
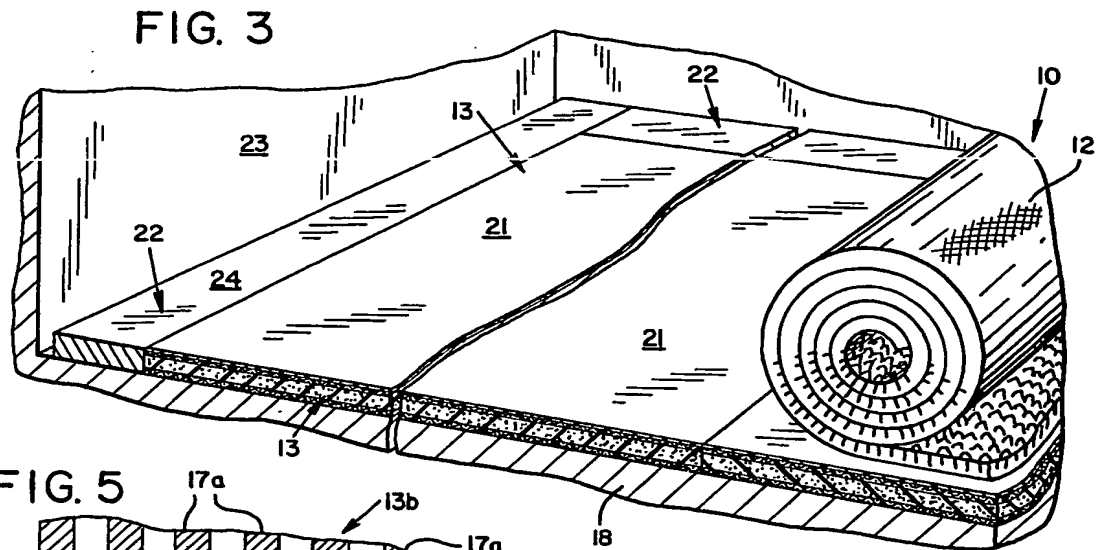
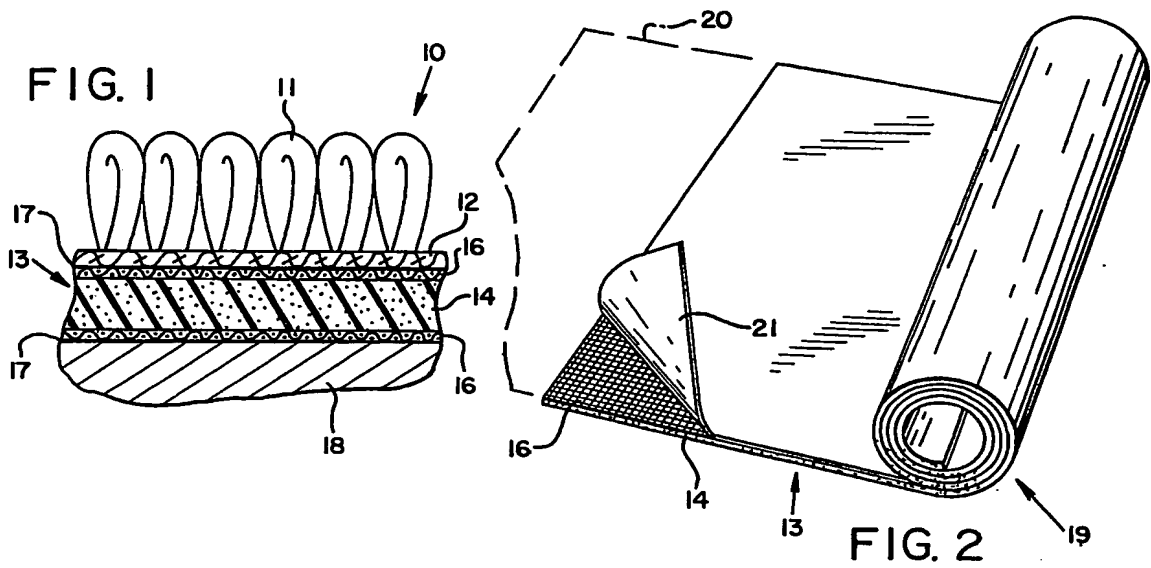


The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.

BEST AVAILABLE C

GB 2 163 973 A

1/2



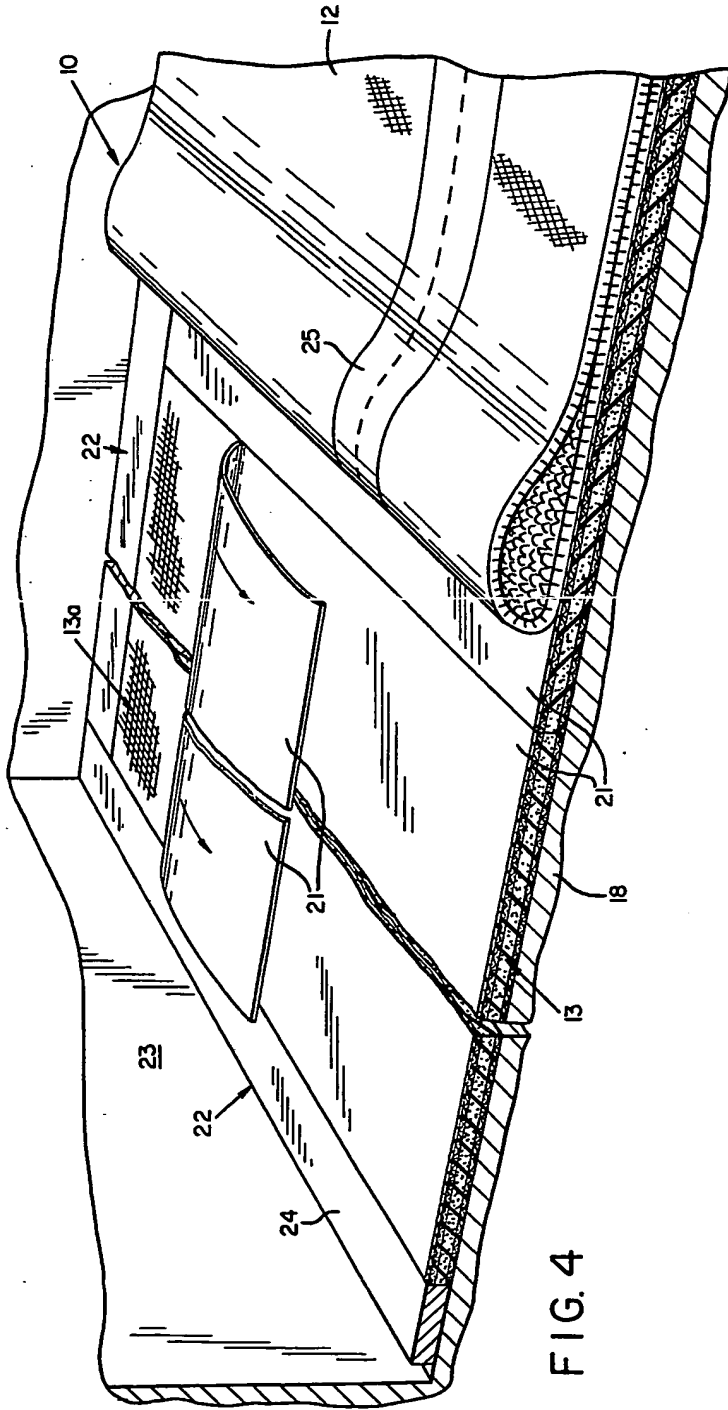


FIG. 4

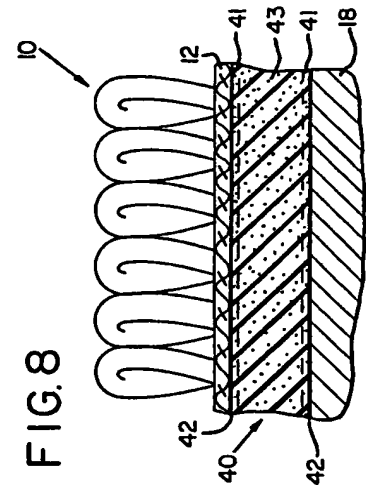


FIG. 8

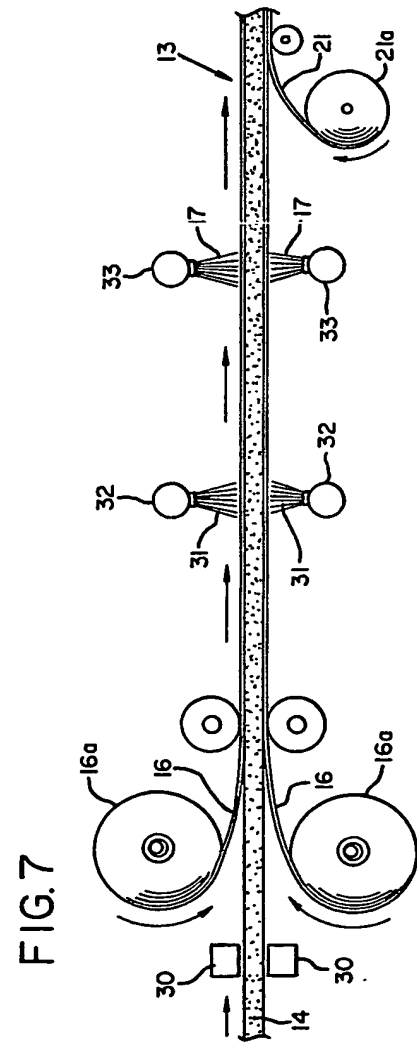


FIG. 7

SPECIFICATION

System for holding carpet in place without stretching

5 The invention relates to carpet installation and carpet cushion or padding, and more particularly to a system for adhering a pad to the floor and a carpet to the pad, eliminating any need for carpet stretching.

10 In the prior art, carpeting has been installed on floors in several different ways. In the conventional tackless strip system, the so-called tackless strip is secured to the floor around the walls of the room, the carpet is hooked onto the upwardly protruding nails of the tackless strip at one side of the room, and the carpet is stretched before it is hooked to the tackless strip at the opposite side of the room. The problems with this system are that it requires the installation of the tackless strip, which is time-consuming and which is difficult when concrete floors are encountered, and also that it requires a trained professional to re-stretch the carpet in the event a corner or edge portion of the carpet needs to be temporarily taken up for installation of wiring, access to the floor or for drying a carpet which has been wetted.

Many carpet installations involve gluing of the carpeting to the floor, without any carpet cushion or pad between the carpet and the floor. With this system, the carpeting can be of less expensive construction, with a primary backing but without the need for a secondary backing which is generally required for stretched carpeting. The glued-down carpeting avoids wrinkling without the need for stretching, but loses the benefit of a carpet pad. Also, the carpet can be very difficult to remove either for replacement or temporarily, for maintenance, without destroying the floor or the carpeting itself due to the adhesion of the glue.

10 In glue-down installations, the carpet is ordinarily laid on the floor first and seamed as required. The glue is then applied to the floor, either in liquid form or by spraying it onto the floor. This can be accomplished by folding back half of the carpet, applying the glue to the floor in that area, and dropping the carpet in place to adhere it to the floor in that area. The opposite side of the carpet could then be folded back, glue applied to the floor in that area, and that portion of the carpet then adhered to the floor.

Another installation system wherein the carpet was adhered to the floor without padding is disclosed in U.S. Patent No. 4,405,668. This system used a separate, thin scrim web with adhesive on both sides and with a release film on one side. The scrim web was placed on a floor with the release film on the upper surface, adhering the web to the floor, whereupon the carpet could then be seamed and cut as required while lying on top of the release film. The carpet was then folded back and the release film removed in one area, that portion of the carpet was pressed down, and the operation was repeated in another area. This system was relatively expensive and still did not permit the installation of a carpet

pad beneath the carpeting. A similar construction of adhesive webbing material is shown in U.S. Patent No. 4,234,649.

In yet another system for installing carpet without stretching, a slab or pad of jute material was interposed between the carpet backing and the floor. In this particular system the floor was sprayed with a wet adhesive, the slab of jute material was laid into the adhesive while the adhesive was still wet, the top surface of the jute material was sprayed with the wet adhesive; and the carpet was laid on the wet adhesive on the top surface of the jute slab or pad. The wet adhesive, as it dried, became enough of a pressure sensitive adhesive to permit the carpet to be pulled up and removed.

This system had the disadvantage of being an expensive system because of the costs required to make an on-the-job installation.

It is an object of the present invention to overcome or at least mitigate the above mentioned problems.

According to one aspect of the present invention, there is provided a carpet pad for retaining a carpet in place on a floor, the pad having means reinforcing at least one of two opposed surfaces thereof, each of the said opposed surfaces having pressure sensitive adhesive thereon for bonding the pad to the floor and carpet, respectively.

According to a second aspect of the present invention, there is provided a carpet pad for installation between a floor and a carpet, for retaining the carpet and pad in place by adhesion without need for stretching, comprising: a synthetic foam pad with opposed upper and lower surfaces; a scrim webbing on at least the lower surface of the foam pad for maintaining dimensional stability of the foam pad, with means for retaining the scrim webbing to the foam pad; a sealant applied to both surfaces of the foam pad; and pressure-sensitive adhesive on both surfaces of the foam pad for adhering to a floor and to the underside of a carpet to hold the carpet and pad in position while allowing for temporary lifting of the carpet wholly or in localized areas when desired.

According to a third aspect, the present invention provides a carpet pad for installation between a floor and a carpet, for retaining the carpet and pad in place by adhesion without need for stretching, comprising: a high-density urethane foam pad with upper and lower surfaces; a heat-formed crust or skin of increased density on the surfaces of the foam pad for maintaining dimensional stability of the foam pad, and for sealing the porosity of the foam pad at the surfaces; and pressure-sensitive adhesive on both surfaces of the foam pad for adhering to a floor and to the underside of a carpet to hold the carpet and pad in position while allowing for temporary lifting of the carpet wholly or in localized areas when desired.

In a fourth aspect, the present invention provides a method of manufacturing an adhesive carpet pad for installation between a floor surface and a carpet for retaining the carpet and pad in place by adhesion without stretching, comprising applying and retaining to a synthetic foam pad a scrim webbing on both surfaces of the foam pad, for maintaining dimen-

sional stability of the foam pad; applying a sealant to both surfaces of the foam pad; applying a pressure-sensitive adhesive to both surfaces of the foam pad; and adhering a release film to the adhesive on one side of the pad so the carpet pad can be stored in a roll.

In a fifth aspect, the present invention provides a method of installing a carpet with a carpet pad, comprising: positioning a carpet pad on a floor surface and trimming as required, the carpet pad having a pressure-sensitive adhesive on upper and lower surfaces thereof and a removable release film on the pressure-sensitive adhesive on the upper surface, and the carpet pad including means for reinforcing the same to maintain dimensional stability in the carpet pad; positioning the carpet on top of the release film on the carpet pad and cutting and seaming the carpet as required; folding back the carpet and removing the release film from the exposed area of the carpet pad; pressing the carpet down onto the exposed pressure-sensitive adhesive on the upper surface of the carpet pad; folding back another portion of the carpet and removing the release film from that area and then pressing that portion of the carpet onto the exposed pressure-sensitive adhesive of the carpet pad; and performing final trimming at the carpet edges as required when the entire carpet has contacted the adhesive.

In a preferred embodiment, spacer strips may be installed on the floor along the walls of the room before laying the carpet pad, preferably strips of wood or plastic with pressure-sensitive adhesive on both sides. The purpose of the spacer strips is to provide an edge similar to that of the tackless strips, since the carpet installer's trimming tools have been designed to trim the carpet with the hard strip present, cutting the carpet $\frac{1}{4}$ inch (63 mm) long and tucking the carpet edge under, against the wall or baseboard. If a tackless strip from a previous carpet installation is present, it may be left in place with no need for the spacer strips.

The reinforcing means for maintaining dimensional stability in the carpet pad preferably comprises a scrim webbing of a fibrous plastic material, such as polyester "leno weave" square webbing, bonded to each surface of the synthetic foam pad of the pad material. In the manufacture of the carpet pad, a sealant preferably is applied to both scrim-covered surfaces of the foam pad to substantially seal the surface, before the pressure-sensitive adhesive is added. This keeps the adhesive at the surface of the foam.

In another embodiment the reinforcing means for maintaining dimensional stability simply comprises a stiffened surface or crust at both the lower and upper surfaces at the foam pad. This can be accomplished by a heat process, for example, which may eliminate the need for any sprayed-on sealant on the surfaces of the foam.

The adhesive need not cover the entire surfaces of the carpet pad, but may be in spaced strips on each surface. Adhesive cost is thereby reduced without adversely affecting the positional stability of the carpet installation. Also, this enables the carpet pad to be stapled or tacked to the floor, if needed in

particular areas, in the spaces between strips of adhesive on the upper surface. The carpet will then bridge the gap over the recess or dimple caused by the stapling, since there is no adhesive in this area.

The adhesive on the pad's surfaces may be in parallel serpentine strips to discourage wrinkling of the carpet, which tends to occur in straight lines.

A carpet pad system embodying the invention enables the use of less expensive carpeting than usually required in stretch/tackless strip installations. The typical stretched carpet includes the upper surface yarn, extending through a bonding mesh such as a polypropylene mesh, with a primary backing of latex and a secondary backing of a jute mesh for resiliency in the stretching operation.

Also, using a carpet pad embodying the invention the adhesive bonding of the carpet to the pad (and the pad to the floor), the carpet does not need an expensive secondary backing, since it is adhered down in substantially all areas and is not stretched.

Thus, carpeting can be efficiently and economically installed without stretching or the need for tackless strips and without liquid glues or spray adhesives, but still with the benefit of a carpet cushion or pad between the floor and the carpet.

In order that the invention may be more readily understood, embodiments thereof will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a fragmentary sectional view showing a carpet and pad installed according to the invention;

Figure 2 is a perspective view showing a carpet pad according to the invention and comprising a part of the installation shown in Figure 1. The pad is shown coming off a roll, with a release film covering one side of the adhesive-coated pad, on the inside of the roll;

Figure 3 is a perspective view showing a floor in preparation for carpet installation according to the invention, with the pad laid on the floor and the carpet being unrolled on top of the pad over the release film;

Figure 4 is a perspective view similar to Figure 3, but showing the carpet pulled back for peeling away the release film from the top surface of the pad, in a portion of the floor where the carpet, already seamed and cut, has been pulled or rolled back;

Figure 5 is a plan view showing a pad according to the invention with its pressure-sensitive adhesive applied in parallel strips rather than over the entire surface of the pad, and showing optional stapling between the strips of adhesive.

Figure 6 is a plan view similar to Figure 4, but showing the adhesive applied in serpentine strips;

Figure 7 is a schematic view indicating a method for producing the carpet pad of the invention;

Figure 8 is a view similar to Figure 1, but showing another form of carpet and pad installation according to the invention.

In the drawings, Figure 1 shows a carpet 10 with a pile 11 and a single backing layer or primary backing 12 laid on a pad or carpet cushion 13 comprising a foam pad 14 and a scrim webbing 16 bonded to both top and bottom surfaces of the pad 14, with an pressure-sensitive adhesive layer 17 also at top and

bottom surfaces on the scrim 16 and on the surfaces of the pad 14 itself, between the mesh of the scrim webbing. The adhesive 17 holds the carpet backing 12 to the carpet cushion 13, and the carpet cushion 5 to the surface of the floor 18 below.

Figure 2 shows a roll 19 of the carpet cushion 13, showing the foam pad 14 and the upper layer of scrim webbing 16 which is bonded to the pad 14 in the manufacturing process. The adhesive layer 17 has been applied after the scrim webbing 16, coating the outer surfaces of the webbing mesh 16 and the exposed areas of the pad surface 14 among the mesh. A release film 21 of a sheet plastics material overlies the upper surface of the carpet cushion 13, 15 i.e., the inner surface of the cushion on the roll 19, being temporarily adhered to that surface. The bottom of the cushion 13, and thus the outer surface of the roll 19 as seen in Figure 2, is not covered by any release film. This enables the cushion to be laid 20 on a floor and adhered to the floor while still leaving the upper surface as a work surface for unrolling the carpet 10 and performing preliminary cutting and seaming operations as necessary. For storage and transport of the roll 19 prior to installation, the 25 release film may have a tail or extension 20 (dashed lines) which wraps around the roll and covers the exposed adhesive.

The scrim webbing 16 gives dimensional stability to the adhesive carpet cushion 13, and helps enable 30 the carpeting to be removed from the cushion, or the cushion to be removed from the floor 18, without destruction of the carpet or the cushion or the floor itself.

Figure 3 illustrates some aspects of the installation 35 operation according to the system of the invention. First, rigid pacer strips 22 may be installed around the edges of the room near the walls 23. The spacer strips 22 may be of wood or plastics, for example, with a pressure-sensitive adhesive 24 on both the 40 upper and lower surfaces. The purposes of the strips 22 is merely to take the place of the conventional tackless strips, in the sense that conventional carpeting tools for trimming the finished carpet are designed to be used along the edges of the tackless 45 strips. If tackless strips are in place from a prior carpet installation, they should be left intact, and the spacer strips 22 would then not be needed.

It should also be understood that the carpet installation according to the invention may be 50 performed without the use of any spacer strips 22 or tackless strips provided the installer uses tools adequate to properly trim the carpet without the presence of the usual rigid strip.

The carpet cushion 13 is unrolled onto the floor 55 along the spacer strips 22, which are of about the same thickness as the cushion, generally in the manner shown in Figure 2.

As indicated in Figure 3, the adhesive carpet cushion 13 is first laid and trimmed on the floor 18, 60 with its lower side adhered to the floor 18 but the release film 21 remaining on the upper surface. The carpet 10 is then unrolled over the top of the release film, and seaming and preliminary cutting is performed as necessary.

65 With the carpet seamed and rough cut it is then

folded back or rolled back as indicated in Figure 4 to expose a portion 13a of the cushion. Carpet seaming is indicated at 25. This enables the release film 21 to be peeled off the upper surface of that portion of the cushion 13a as indicated in Figure 4. Once this is 70 accomplished, the carpet is put back into position on the sticky upper surface of the cushion portion 13a and the same operation is repeated with another portion of the carpet 10 which may be the other half 75 of the room. That is, the carpet is pulled or folded or rolled back to expose another portion or the remainder of the carpet cushion and its release film 21 is peeled off. Then the remaining portion of the carpeting is moved back into position, until all areas 80 of the carpet are in contact with the upper surface of the carpet cushion, and final trimming operations are conducted.

Figure 5 shows a carpet cushion 13b according to the invention, with spaced strips of adhesive 17a 85 upon the surface, separated by spaces 26 of the surface which have no adhesive. This saves on the amount of adhesive required while still providing for adequate adhesion of the carpet cushion 13b to both the floor and the carpet backing. Also, it enables 90 staples 27 or tacks to be used to hold the carpet cushion 13b down to the floor if required under special circumstances, without causing the carpet to recess or "dimple" inwardly at the location of the staple. Dimpling is avoided because there is no 95 adhesive in the immediate vicinity of each staple 27, so the carpet does not adhere into the recess in the cushion caused by the staple, but rather the carpet bridges across the recess.

Figure 6 shows a serpentine pattern for adhesive 100 strips 17b on a carpet cushion 13b, which may be desired to prevent a pattern of wrinkling in the installed carpet. Wrinkles tend to occur in straight lines, so that the serpentine pattern shown in Figure 6 discourages the occurrence of wrinkles.

As indicated in Figure 7, in the manufacture of the adhesive carpet cushion 13, the scrim webbing 16 is bonded to both sides of the foam sheet 14, preferably as the foam pad 13 is being formed. The webbing 16b may be bonded to the surfaces of the pad 14 by a heat bonding process, as by heaters indicated at 30, so that it is fused into the surfaces of the foam pad during the manufacturing process, or it may be bonded by other suitable means such as adhesives. In any event, a sealant 31 preferably is 115 applied, as by liquid application or spraying by spray nozzles 32 on both surfaces of the pad with the webbing attached. This substantially closes the porosity of the foam at the surfaces. Next, an adhesive 17 such as hot melt adhesive is applied to 120 the webbing and foam surfaces, as by sprayers 33, and the adhesive does not penetrate into the foam due to the prior application of the sealant.

The release film 21 is next applied to one side of the carpet cushion 13, temporarily bonding to the 125 adhesive on that side. Preferably, all of these operations are accomplished in a continuous process wherein the foam 14, scrim webbing 16 and release film 21 are advanced off roll stock 16a and 21a as schematically indicated in Figure 7. The 130 sealant and adhesive are applied at appropriate

points in the operation, and the final product emerges complete and is stored in rolls 19 similar to that shown in Figure 2.

In Figure 8 a carpet 10 and pad installation is shown, using a modified form of adhesive cushion 40 according to another embodiment of the invention. The cushion 40 has no scrim webbing on either surface, but instead relies on a stiffness or "crust" 41 on each surface, with the adhesive 42 applied to these higher-density surfaces 41.

The cushion 40 preferably comprises a high-density urethane foam 43, which when heat-cured forms a skin or crust 41 of increased density. The skin 41 is dense enough that it seals the surfaces and closes the porosity, obviating the need for any sealant 31 (Figure 7). With this skin, the adhesive 42 will not wick into the foam 43. Also, the skin is stiff enough to provide the required dimensional stability.

The foam cushion 40 may be either flat-surfaced or waffle-surfaced. A waffled surface may be preferable in that it uses less adhesive if the adhesive is rolled (rather than sprayed) onto the surface.

It should be understood that an adhesive carpet cushion according to the invention can be formed with scrim webbing on one or both surfaces, or none. Dimensional stability can be achieved with scrim on one surface only. If one surface has the scrim, it normally is the lower surface in the installation, since at that surface it is more important that the pad be removable from the floor without damage to the pad or the floor.

CLAIMS

1. A carpet pad for retaining a carpet in place on a floor, the pad having means reinforcing at least one of two opposed surfaces thereof, each of the said opposed surfaces having pressure sensitive adhesive thereon for bonding the pad to the floor and carpet, respectively.
2. A carpet pad according to claim 1, wherein the pad is synthetic foam pad.
3. A carpet pad according to claim 1 or 2, wherein a sealant is applied to both of the said opposed surfaces of the pad.
4. A carpet according to claim 1, 2 or 3, wherein the reinforcing means comprises a scrim webbing provided on at least one of the said two opposed surfaces.
5. A carpet pad for installation between a floor and a carpet, for retaining the carpet and pad in place by adhesion without need for stretching, comprising: a synthetic foam pad with opposed upper and lower surfaces; a scrim webbing on at least the lower surface of the foam pad for maintaining dimensional stability of the foam pad, with means for retaining the scrim webbing to the foam pad; a sealant applied to both surfaces of the foam pad; and pressure-sensitive adhesive on both surfaces of the foam pad for adhering to a floor and to the underside of a carpet to hold the carpet and pad in position while allowing for temporary lifting of the carpet wholly or in localized areas when desired.
6. A carpet pad according to claim 4 or 5, with

scrim webbing on both of the said opposed surfaces of the foam pad.

7. A carpet pad according to claim 1 or 2, wherein the pad is a urethane foam pad.

8. A carpet pad according to claim 1, 2, 3 or 7, wherein the reinforcing means comprises a heat-formed crust a skin of increased density relative to the remainder of the pad formed on one or both of the said opposed surfaces of the pad.

9. A carpet pad for installation between a floor and a carpet, for retaining the carpet and pad in place by adhesion without need for stretching, comprising: a high-density urethane foam pad with upper and lower surfaces; a heat-formed crust or skin of increased density on the surfaces of the foam pad for maintaining dimensional stability of the foam pad, and for sealing the porosity of the foam pad at the surfaces; and pressure-sensitive adhesive on both surfaces of the foam pad for adhering to a floor and to the underside of a carpet to hold the carpet and pad in position while allowing for temporary lifting of the carpet wholly or in localized areas when desired.

10. A carpet pad according to any preceding claim, further including a removable release film on one of the said opposed surfaces of the pad, to facilitate roll storage and for manipulating a carpet on the laid pad, before adhering the carpet to the pad.

11. A carpet pad according to any preceding claim, wherein the pressure-sensitive adhesive is provided in spaced strips on the surfaces of the pad.

12. A carpet pad according to claim 11, wherein the spacing between the strips of adhesive is not more than two inches (5.08 cm).

13. A carpet pad according to any preceding claim, wherein the said opposed surfaces of the pad are waffled, the adhesive being rolled on, so that less adhesive is required.

14. A carpet pad substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.

15. A carpet whenever laid using a carpet pad in accordance with any preceding claim.

16. A carpet pad according to claim 15, wherein the carpet has a primary backing as its only backing.

17. A method of manufacturing an adhesive carpet pad for installation between a floor surface and a carpet for retaining the carpet and pad in place by adhesion without stretching, comprising applying and retaining to a synthetic foam pad a scrim webbing on both surfaces of the foam pad, for maintaining dimensional stability of the foam pad; applying a sealant to both surfaces of the foam pad; applying a pressure-sensitive adhesive to both surfaces of the foam pad; and adhering a release film to the adhesive on one side of the pad so the carpet pad can be stored in a roll.

18. A method of manufacturing an adhesive carpet pad for installation between a floor surface and a carpet for retaining the carpet and pad in place by adhesion without stretching, substantially as hereinbefore described with reference to the accompanying drawings.

19. A method of installing a carpet with a carpet

- pad, comprising: positioning a carpet pad on a floor surface and trimming as required, the carpet pad having a pressure-sensitive adhesive on upper and lower surfaces thereof and a removable release film
- 5 on the pressure-sensitive adhesive on the upper surface, and the carpet pad including means for reinforcing the same to maintain dimensional stability in the carpet pad; positioning the carpet on top of the release film on the carpet pad and cutting and
- 10 seaming the carpet as required; folding back the carpet and removing the release film from the exposed area of the carpet pad; pressing the carpet down onto the exposed pressure-sensitive adhesive on the upper surface of the carpet pad; folding back
- 15 another portion of the carpet and removing the release film from that area and then pressing that portion of the carpet onto the exposed pressure-sensitive adhesive of the carpet pad; and performing final trimming at the carpet edges as required when the entire carpet has contacted the adhesive.
- 20 20. A method according to claim 19, including installing rigid spacer strips on the floor along the walls of the room prior to laying the carpet pad.
21. A method according to claim 20, wherein the
- 25 rigid spacer strips have pressure-sensitive adhesive on their upper and lower surfaces.
22. A method according to claim 19, 20 or 21, wherein the pressure-sensitive adhesive is in spaced strips on the surfaces of the carpet pad.
- 30 23. A method according to claim 22, wherein the spaced strips are in a serpentine configuration.
24. A method according to claim 22 or 23, further comprising stapling the carpet pad to the floor as needed prior to positioning the carpet on the release
- 35 film of the carpet pad, the stapling being done between the spaced strips of adhesive on the upper surface of the carpet pad so that dimples formed in the carpet pad at the stapling will occur in areas devoid of adhesive, whereby the carpet will span the
- 40 dimples without adhering into them.
25. A method according to any one of claims 19 to 24, wherein the reinforcing means for maintaining dimensional stability comprises a scrim webbing retained on at least the lower surface of the carpet
- 45 pad.
26. A method according to any one of claims 19 to 25, wherein the reinforcing means for maintaining dimensional stability comprises a heat formed skin of increased density at the upper and lower surface
- 50 of the carpet cushion, the cushion comprising a high-density urethane foam.
27. A method of installing a carpet with a carpet pad, substantially as hereinbefore described with reference to the accompanying drawings.
- 55 28. Any novel feature or combination of features described herein.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☒ BLACK BORDERS
- ☒ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☒ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.